FAIRCHILD, INTEL, AND RAYTHEON SITES
MIDDLEFIELD/ELLIS/WHISMAN (MEW) STUDY AREA
MOUNTAIN VIEW, CALIFORNIA

EXPLANATION OF SIGNIFICANT DIFFERENCES

United States Environmental Protection Agency

Region IX -- San Francisco, California

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Fairchild, Intel, and Raytheon Sites
Middlefield/Ellis/Whisman Study Area
Mountain View, California

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I. INTRODUCTION

The purpose of this document is to explain the significant differences between the Record of Decision (ROD) signed by the U.S. Environmental Protection Agency (EPA) on June 9, 1989 and the remedy that will be implemented at the Middlefield/Ellis/Whisman Study Area (MEW Site). Under Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendment and Reauthorization Act of 1986 (CERCLA), 42 U.S.C. § 9617, EPA is required to publish an Explanation of Significant Differences (ESD) whenever a significant change is made to a final remedial action plan. This document provides a brief background on the MEW Site, describes the change to the ROD that EPA is now making and explains the ways in which this change affects implementation of the remedy selected by EPA in June of 1989.

Based on the technical data in the administrative record, EPA is changing the ROD to provide that the numerical standards characterized as "goals" in the original ROD are final cleanup "standards". This change is made to clarify and ensure that EPA is selecting in the ROD a specific remedial action rather than

deferring to a later date to set these standards. EPA is issuing this ESD to effectuate this change in lieu of amending the ROD because the change does not result in a fundamental change to the overall remedy selected in the June 9, 1989 ROD.

II. BACKGROUND

A. Site Name and Location. The MEW Site is located in Santa Clara County in the City of Mountain View, California. The MEW Site is divided into a Local Study Area (LSA) and a Regional Study Area (RSA). Figure 1-1 identifies the LSA and RSA, along with local roads and landmarks. The LSA consists of (i) two National Priority List (NPL) sites: Intel Corporation (Intel) and Raytheon Company (Raytheon); (ii) one proposed NPL site: Fairchild Semiconductor Corporation (Fairchild); and (iii) several non-NPL sites. The LSA encompasses about 1/2 square mile of the RSA and contains primarily light industrial and commercial areas, with some residential areas west of Whisman Road. The RSA encompasses approximately 8 square miles and includes Moffett Naval Air Station (another NPL site) and NASA Ames Research Center, along with light industrial, commercial, agricultural, residential, recreational, and municipal land uses.

Various owners or occupants in the area around the intersection of Middlefield Road, Ellis Street, Whisman Road, and the Bayshore Freeway (U.S. Highway 101), are or were involved in the manufacture of semiconductors, metal finishing operation, parts cleaning, aircraft maintenance, and other activities requiring the use of a variety of chemicals. Local facilities with current occupants are presented in Figure 1-2. Site investigations at several of these facilities have revealed the presence of toxic chemicals in the subsurface soils and in the groundwater.

B. Identification of Lead and Support Agencies. Since May 1985, EPA has been the lead agency at the MEW Site. The California Regional Water Quality Control Board - San Francisco Bay Region (RWQCB) and the California State Department of Health Services (DHS) are the support agencies for the MEW Site.

C. Circumstances. During negotiations with Potentially Responsible Parties (PRPs) to implement the remedy selected by EPA in the June 9, 1989 ROD, EPA determined that the language contained in the ROD and in the administrative record concerning the selected remedial action was ambiguous. EPA is issuing this ESD to clarify that it has selected a remedial action with final cleanup standards for the MEW Site.

D. Statement Regarding the Administrative Record. This ESD will become part of the Administrative Record file located at:

U.S. Environmental Protection Agency, Region IX
Superfund Records Center
75 Hawthorne Street
San Francisco, CA 94105
Hours: M-F 8:00 a.m. - 4:30 p.m., and

Mountain View Public Library
585 Franklin Street
Mountain View, CA 94041
Hours: M-TH 10:00 a.m. - 9:00 p.m.
F, Sat., and Sun. 10:00 a.m. - 6:00 p.m.

E. Site History. During 1981 and 1982, preliminary investigations of facilities within the LSA found significant concentrations of contaminants in the soil and the groundwater. By 1984, the Fairchild, Intel, and Raytheon Sites were proposed for inclusion on the federal National Priorities List (NPL). Intel and Raytheon were listed on the NPL in June 1986. In 1985, under the direction of the RWQCB, five companies within the LSA [Fairchild; Intel; Raytheon; NEC Electronics, Inc. (NEC); and Siltec Corporation (Siltec)] initiated a joint investigation to document and characterize the distribution of chemicals emanating from their facilities. In April 1985, the RWQCB adopted Waste Discharge Requirements for each of the five companies.

On August 15, 1985, Fairchild, Intel, and Raytheon entered into an Administrative Consent Order with EPA, the RWQCB, and the DHS. Under the terms of the Consent Order, the three companies

conducted a Remedial Investigation and Feasibility Study (RI/FS) of the contamination emanating from the LSA. Prior to and during site investigations, the companies conducted interim cleanup activities at the MEW Site. These interim remedial actions included tank removals, soil removal and treatment, well sealing, construction of slurry walls, and treatment of groundwater from several extraction wells. NEC and Siltec declined to enter into the Administrative Consent Order.

The RI was concluded in July 1988. A draft Feasibility Study and EPA's Proposed Plan were presented to the community for a 60-day review and public comment period beginning in November 1988. In May 1989, Special Notice Letters for the Remedial Design/Remedial Action (RD/RA) Consent Decree were sent out to Fairchild, Intel, Raytheon, NEC, Siltec, and twelve (12) other PRPs. EPA signed the ROD on June 9, 1989.

F. Nature and Extent of Contamination. Industrial activities conducted within the MEW Site required the storage, handling, and use of a large number of chemicals, particularly solvents and other chemicals used in a variety of manufacturing processes. Significant quantities of volatile organic chemicals were used for degreasing, process operating, and general maintenance. Product and waste solvents and other chemicals were piped and stored in underground tanks, pipelines, and sumps. Chemical releases occurred, for the most part, below the ground

surface and migrated downward into the aquifer system. The presence of these chemicals in the subsurface soils and groundwater is primarily the result of leaks from the subsurface tanks and lines, sumps, chemical handling and storage areas, and utility corridors.

Investigations at the MEW Site have revealed the presence of over 70 chemical compounds in the groundwater, surface water, sediments, and subsurface soils. Three major classes of chemicals were investigated during the RI: (i) volatile organic compounds, (ii) semi-volatile acid and base/neutral extractable organic compounds, and (iii) priority pollutant metals. Of these three classes, volatile organics were found to be the most prevalent.[1]

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[1] Since over 70 chemicals were detected at the MEW Site, a subset of 15 key chemicals of primary concern was selected in order to focus on those contaminants that were most likely to pose risks to human health, welfare, and the environment. The chemicals of primary concern consist of 11 organics of concern and 4 inorganics of concern. Of these 15 chemicals of primary concern, trichloroethene (TCE) is the predominant chemical found at the MEW Site. EPA's decision to designate only 15 chemicals as "chemicals of primary concern" was based in part on the assumption that the sampling provided a complete picture of the actual contamination in the groundwater (generally, chemicals detected in less than 5% of the samples extracted are not considered to be "chemicals of primary concern"). Once implementation of the remedy has begun, the groundwater beneath the MEW Site will be monitored periodically for the chemicals that have not been designated as chemicals of primary concern to ensure that no areas of high chemical concentration have gone undetected, that the calculations of health-based risks remain valid, and that the remediation is effective.

An extensive area of groundwater contamination has been defined in the RI and is presented in Figure 2. Current MEW Site data indicate that chemicals are present primarily in the A, B1, and B2 aquifer zones. Chemicals have also been detected in localized areas of the B3, C, and deeper aquifer zones.

Subsurface soil contamination has been found at the Fairchild, Intel, and Raytheon facilities, along with the facilities of other PRPs within the RSA.

G. Description of the June 9, 1989 ROD.

1. Soil Remediation. In the June 9, 1989 ROD, EPA's selected soil remedy is in-situ vapor extraction with treatment by vapor phase granular activated carbon, and excavation with treatment by aeration. In the ROD, EPA established a cleanup goal for soils of 1 part per million (ppm) trichloroethene (TCE) for soils inside of existing slurry walls and 0.5 ppm TCE for soils outside of the slurry walls. Chemicals found in the subsurface soils were generally similar to those found in adjacent groundwater samples. As part of the RD/RA, some additional soil investigation may be necessary in certain areas to ensure the effectiveness of the remedy.[2]

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[2] Since TCE was the predominant chemical at the MEW Site, it was selected as the indicator chemical to monitor the extent of soil contamination and the progress of soil remediation for all chemicals at the MEW Site. Because other chemicals present in the subsurface soils may not be commingled with TCE and may act as a continuing source of contamination to the groundwater, it will be necessary to closely monitor the remediation of the

2. Groundwater Remediation. In the June 9, 1989 ROD, EPA's selected groundwater remedy is extraction and treatment. Extracted groundwater will be treated using air stripping towers. Airborne emissions will meet all Bay Area Air Quality Management District emissions standards. It is anticipated that emission controls utilizing granular activated carbon will be required once the full remedy is implemented. The extracted groundwater will be reused to the maximum extent feasible, with a goal of 100% reuse. Extracted water which cannot be reused will be discharged to local streams. Allowable discharges to local streams will be regulated by the National Pollutant Discharge Elimination System (NPDES) of the Clean Water Act.

In the June 9, 1989 ROD, EPA set groundwater cleanup goals of 5 parts per billion (ppb) TCE for the shallow aquifers (which are not currently used for drinking water) and 0.8 ppb TCE for the deep aquifers (which are used for drinking water). The shallow aquifer cleanup goals also applied to the aquifers inside the slurry walls.

Although over seventy chemicals have been detected in the soil and groundwater at the MEW Site, TCE is the predominant chemical. Therefore, TCE is used as a broad indicator of the

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soils to ensure that all chemicals are remediated so that their respective concentration levels are at or below applicable or relevant and appropriate requirements (ARARs) and do not exceed maximum cumulative risk levels.

size and extent of contamination. The ratio of TCE to other chemicals found at the MEW Site is high enough such that when TCE is reduced to the cleanup level of 5 ppb in the shallow aquifers and 0.8 ppb in the deep aquifers, it is assumed that the other chemicals found at the MEW Site will be reduced to concentrations that meet applicable or relevant and appropriate requirements (ARARs) and do not exceed maximum cumulative risk levels.[3]

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[3] With respect to the organic chemicals found in the groundwater, EPA selected a health-based cleanup strategy that provided (i) for carcinogens, a cumulative excess lifetime cancer risk no greater than 10^{-5} for the shallow aquifers and 10^{-6} for the deep aquifers, and (ii) for non-carcinogens, levels protective of human health, welfare, and the environment based on ARARs and reference doses. Selecting 5 ppb and 0.8 ppb as the cleanup levels for TCE in the shallow and deep aquifers, respectively, was based on the assumption that by reducing the concentrations of TCE to these levels the concentrations of the other chemicals at the MEW Site would be proportionately and correspondingly reduced to: (i) levels with risks low enough to meet a cumulative excess lifetime cancer risk no greater than 10^{-5} for the shallow aquifers and 10^{-6} for the deep aquifers, and (ii) levels at or below ARARs or levels based on reference doses for non-carcinogens in the shallow and deep aquifers. If the levels of the various chemicals are not reduced at the same rate as TCE or if some of the existing chemical compounds begin to transform into more toxic compounds at a rate faster than anticipated, then EPA's assumption that TCE accurately acts as an indicator chemical may need to be re-assessed. Thus, chemical concentrations will be monitored throughout the RD/RA process to assess the validity of EPA's underlying assumptions and to determine whether TCE remains an appropriate indicator chemical for reducing concentrations of the other chemicals.

Because data gathered to date on the inorganics found at the MEW Site are somewhat limited, EPA decided that it would be premature to exclude the inorganics from the list of chemicals of primary concern. Four inorganics were selected as chemicals of primary concern, but were analyzed as a group rather than individually. The four inorganics of concern will be monitored throughout the RD/RA process to ensure that no isolated concentrations of these chemicals remain undetected and that adequate data are available for any future evaluation of the risks posed by the presence of these chemicals.

Should this assumption be proven to be false, the other chemicals of primary concern found in the soil or groundwater at the MEW Site are to be remediated so that their respective concentration levels are at or below ARARs and do not exceed maximum cumulative risk levels.

3. Sealing of Potential Conduit Wells. The remedy includes the identification and sealing of any potential conduit wells. Several abandoned agriculture wells that acted as conduits for contamination to migrate from the shallow aquifers to the deep aquifers have already been sealed. Additional wells have been identified for sealing and others may be identified which will also require sealing.

4. Maintenance of Slurry Walls. The remedy also includes maintaining inward and upward hydraulic gradients inside of the slurry walls and monitoring the integrity of each slurry wall system. Maintaining inward and upward hydraulic gradients by pumping inside of the slurry walls will prevent contaminants from escaping in the event the slurry walls fail. Selected wells will be monitored for chemical concentrations and water levels.

III. EXPLANATION OF SIGNIFICANT DIFFERENCES

This ESD supersedes and clarifies certain points set forth in EPA's ROD dated June 9, 1989. Briefly, and as explained in greater detail below, this ESD addresses the following issues:

1. The cleanup "goals" established for both groundwater and soil contamination at the MEW Site are hereby set as final cleanup standards.

2. In determining whether future changes should be made to the ROD, EPA will consider all legally applicable and appropriate criteria.

3. If EPA determines that an amendment to the ROD is necessary, EPA will follow all required procedures, including the public notice and comment procedures required by Section 117 of CERCLA, 42 U.S.C. § 9617.

A. Cleanup Standards. As discussed in detail in the ROD, EPA selected remedial actions for both soil and groundwater contamination. The remedy selected for soil contamination is in-situ vapor extraction with treatment by vapor phase granular activated carbon, and excavation with treatment by aeration. EPA specified two cleanup goals for soils: 1 ppm TCE for soil inside of slurry walls located on the Raytheon and Fairchild facilities,

and 0.5 ppm TCE for all other soils located on the MEW Site.

In addition, EPA selected groundwater extraction and treatment to address the groundwater contamination. EPA specified two cleanup goals for groundwater: 5 ppb TCE for the shallow aquifers and 0.8 ppb TCE for the deep aquifers.

EPA expressed these cleanup levels as goals because it recognized that there is an uncertainty as to what actual cleanup levels will be achieved during the implementation of the remedial action. However, this uncertainty inherently exists at many Superfund sites that are implementing groundwater extraction treatment remedies or innovative treatment technologies. Accordingly, upon re-evaluation of the administrative record, EPA has now determined that there is a sufficient basis for changing the "cleanup goals" established in the ROD to "final cleanup standards." A basis for making this change is EPA's determination that there is insufficient information at this time to invoke a waiver of statutorily required cleanup standards, pursuant to Section 121(d)(4) of CERCLA, 42 U.S.C. § 9621(d)(4).

Under Section 121 of CERCLA, 42 U.S.C. § 9621, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R Part 300, EPA is required to select a remedy that is protective of human health and the environment and that meets all ARARs. EPA can only select a remedy that does not meet an

ARAR if it formally invokes a waiver based on at least one of the six factors set forth in Section 121(d)(4) of CERCLA, 42 U.S.C. § 9621(d)(4). One of these six factors allows a waiver when the remedy selected is "technically impracticable from an engineering perspective" [See Section 121(d)(4)(c) of CERCLA, 42 U.S.C. § 9621(d)(4)(c)].

The authority of EPA to invoke an ARAR waiver based on "technical impracticability" is limited under CERCLA. The use of the term "impracticable" implies that remedies that are not demonstrated but that are thought to be feasible cannot be eliminated because of this waiver. This waiver should be used in cases where: (i) neither existing nor innovative technologies can reliably attain the ARAR in question, or (ii) attainment of the ARAR in question would be illogical or infeasible from an engineering perspective [53 Federal Register 51439 (December 21, 1988)]. Accordingly, based on its re-evaluation of the administrative record, EPA has determined that there is insufficient information to invoke a waiver to ARARs at the MEW Site at this time.

Although EPA's original ROD did not formally invoke a waiver, the Feasibility Study, which is included as part of the administrative record, provides that final cleanup standards will depend upon the "technical practicability" of achieving those goals. EPA, through this ESD, is clarifying that it will

consider technical practicability or impracticability as a factor in evaluating whether in the future it should formally invoke a waiver of an ARAR. EPA will make such an evaluation, if appropriate, on the basis of information generated during the Remedial Action phase of the remedy.

In summary, this ESD supersedes the June 9, 1989 ROD by setting final cleanup standards that represent the technical parameters of its chosen remedy and therefore are present enforceable obligations for the MEW Site.

B. Future Changes to the Selected Remedy. When EPA selects a remedy for a Superfund site, at a minimum, it must ensure that the remedy is protective of human health and the environment, complies with all ARARs (or the record supports a waiver), utilizes permanent solutions and alternative technology to the maximum extent practicable, and satisfies the statutory preference for treatment as a principal element (See Section 121 of CERCLA, 42 U.S.C. § 9621). EPA selects this remedy based on the information in the administrative record.

The administrative record for the MEW ROD and for many Superfund sites contains data that indicate that there is some degree of uncertainty as to whether the chosen technologies will be able to achieve the cleanup standards specified. EPA acknowledged in the Proposed Plan for the June 9, 1989 ROD that

"[c]leanup goals do not necessarily represent the actual 'cleanup levels' that are eventually achieved, because the effectiveness of the remedy can only be determined during implementation [Remedial Action Phase] of the remedy." (See, Proposed Plan page 7).

As discussed above, EPA is now changing the June 9, 1989 ROD by now specifying final cleanup standards rather than just goals. EPA is making this change because it has determined that there is insufficient information at this time to invoke a waiver to ARARs. However, EPA continues to recognize that it is always possible that the chosen remedy will be demonstrated to be unattainable. Therefore, EPA recognizes that if data are generated that demonstrate that the selected remedy cannot be achieved, EPA may need to reconsider its decision embodied in the ROD.

In addition, there are other reasons that could lead EPA to determine that the ROD should be changed. Under Section 121(c) of CERCLA, 42 U.S.C. § 9621(c), EPA is required to review every five years all Superfund sites where hazardous substances remain on the site to ensure that human health and the environment are protected. Therefore, it is possible that EPA may determine that a remedy selected in the ROD should be changed to provide for even greater protection to human health and the environment.

EPA recognizes that new information may be generated during the RD/RA process that could affect the remedy selected in the ROD. This information, which may be developed by the PRPs, support agencies, public, or EPA, may form the basis for a proposed amendment to the ROD or an ESD. In determining whether a change to the ROD is appropriate, EPA will consider all legally applicable requirements.

C. Process for Future Amendments to the ROD. If new information is submitted by the public, PRPs, the support agencies, or developed by EPA during the implementation of the remedial action, EPA may reconsider the hazardous waste management approach selected in the ROD. If EPA determines that the ROD should be changed it will follow all applicable requirements, including those of Section 117 of CERCLA, 42 U.S.C. § 9617.

Daniel W. McGovern
Regional Administrator

PUBLIC NOTICE

The Environmental Protection Agency announces the availability of an explanation of significant differences for

Middlefield-Ellis-Whisman (MEW) Study Area Mountain View, California

Under Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended by the Superfund Amendment and Reauthorization Act of 1986 (CERCLA), the U.S. Environmental Protection Agency (EPA) is required to publish an Explanation of Significant Differences (ESD) whenever a significant change is made to a final cleanup plan.

The purpose of the ESD is to explain significant differences between the Record of Decision (ROD) for the MEW study area, which was signed by the EPA on June 9, 1989, and the remedy which will be implemented at the site.

In summary, the EPA is changing the ROD to specify that the numerical standards for cleanup (characterized as "goals" in the original ROD) are the final cleanup "standards". This change is made to clarify and ensure that in the ROD, the EPA selected a specific remedial action and is not deferring until a later date the setting of specific cleanup standards for the contaminated soils and groundwater at this site.

This document is available for review at:

Mountain View Public Library
585 Franklin St.
Mountain View, CA 94041
(415) 966-6335

If you have any questions, please contact:

Fraser Felter
Community Relations Coordinator
Environmental Protection Agency
1235 Mission St. (H-1-1)
San Francisco, CA 94103
(415) 744-1764